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ABSTRACT

This digest reviews research on the link between children's nutrition and their ability to learn from the prenatal through school years. It also discusses the importance of nutrition education for children. The need for adequate nutrition during pregnancy and the preschool years is highlighted by research that indicates that low birthweight children are more likely than other infants to have learning problems and require special education services; and that children whose mothers had participated in the Special Supplemental Food Program for Women, Infants and Children (WIC) scored higher on vocabulary tests than children whose mothers had not received WIC benefits. During the school years, anemic children tend to do poorly on vocabulary and reading tests; and hunger, skipping breakfast, and poor nutrition have a negative impact on students' cognitive performance. Poor nutrition among American children is due in part to poor eating habits, which include overeating, skipping breakfast, and using unsafe dieting methods, and, in part, to poverty. Children's nutrition habits are affected by the messages they receive from television and food packaging about foods high in sugar, salt, or fat. These messages can be countered by nutrition education in school, which is most effective when it delivered in the context of a comprehensive health education program. To foster children's knowledge of nutrition, schools can coordinate nutrition education with cafeteria meals, provide materials for parents about nutrition, and offer only nutritious foods at school; dietitians can speak to students about good nutrition; and parents can set a good example by eating healthfully, letting their children prepare meals, and exposing their children to new foods. (BC)

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Children's Nutrition and Learning

National Health/Education Consortium

Children of all socioeconomic levels are at-risk for poor nutrition. Some children do not get enough to eat each day because their families lack money to buy sufficient food. Other children consume enough food but have diets high in fat, sugar, and sodium that put them at risk for obesity or heart disease and other chronic illnesses. Furthermore, as the number of parents in the workforce increases, more children are being left to fend for themselves for meals.

The premise that nutrition affects children's ability to learn is not new. The link has been recognized for some time through anecdotal evidence and, more recently, through controlled research studies. This digest reviews research on the link between nutrition and learning from the prenatal through school years, and considers the importance of nutrition education for children.

Nutrition and Learning: The Prenatal Period

Inadequate weight gain during pregnancy can increase the risk of having a low birthweight (under 5.5 pounds) baby. Low birthweight infants are more likely than other infants to have hearing, vision, or learning problems and to require special education services. Recent evidence indicates that 15% of very low birthweight (less than 3.5 pounds) children and nearly 5% of low birthweight children require special education, compared to 4.3% of children born at normal birthweight (Newman, 1991).

The Special Supplemental Food Program for Women, Infants and Children (WIC) provides food and nutrition education to pregnant and lactating low-income women. A 5-year national evaluation of this program found that young children whose mothers had participated in WIC scored significantly higher on vocabulary tests than children whose mothers did not receive WIC benefits (Rush, 1986).

Nutrition and Learning: Preschool and School Years

Iron deficiency is one of the most prevalent nutritional problems of children in the United States. Iron deficiency in infancy may cause a permanent loss of IQ later in life. Iron deficiency and anemia lead to shortened attention span, irritability, fatigue, and difficulty with concentration. Consequently, anemic children tend to do poorly on vocabulary, reading, and other tests (Parker, 1989).

Several studies have found effects of hunger and poor nutrition on cognitive ability. One such study found that among fourth grade students, those who had the least protein intake in their diets had the lowest achievement scores (ASFSA, 1989).

A laboratory study that involved healthy, well-nourished school-aged children found a negative effect of morning fasting on cognitive performance. A test of the speed and accuracy of response on problem-solving tasks given to children who did or did not eat breakfast found that skipping breakfast had an adverse influence on their performance on the tests (Pollitt et al., 1991).

Children who are hungry or undernourished also have more difficulty fighting infection. Therefore, they are more likely to become sick, miss school, and fall behind in class.

Poor Eating Habits and Poverty

Poor nutrition among children in America is on the rise. This rise is due, in part, to poor eating habits, which include overeating and skipping meals. The U.S. Department of Health and Human Services (DHHS) found that from 1984 to 1991 there was a 42% increase in the number of children between 3 and 17 years of age who were overweight (U.S. DHHS, 1992-93). The National Adolescent Student Health Survey found that, among eighth- and tenth-graders surveyed, 40% reported eating breakfast fewer than three times per week. The same study revealed unsafe methods of weight control by adolescents. Among students who dieted for weight control, about half said they hardly eat or fast, 16% reported using diet pills, 12% claimed they vomit after meals, and 8% reported using laxatives (ASHA et al., 1989).

The rise in poor nutrition among American children is also due to increased poverty. A survey by the U.S. Conference of Mayors found that requests for emergency food assistance from families with children increased by 14% from 1991 to 1992 (Waxman, 1992). The Community Childhood Hunger Identification Project (CCHIP) estimates that 12% of U.S. families with children under age 12 experience hunger, based on parents' responses to survey questions. This survey found correlations between rates of poverty and rates of reported hunger. The CCHIP survey also found that children in families who reported hunger were more likely to suffer from infections, have trouble concentrating, and miss school than nonhungry children (Wehler et al., 1991).

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Strong evidence exists that nutrition-related disorders are greater among low-income households than among the rest of the population. Growth retardation, which may reflect dietary inadequacy, occurs in preschool children from low-income families at up to three times the rate as in their nonpoor peers. Iron deficiency anemia is twice as common in poor children between ages 1 and 2 than it is in the general population (Parker, 1989).

Messages to Children about Nutrition

With the increase in the number of working parents and the ubiquity of fast-food establishments, children are eating more meals away from home than ever before. One study found that children in urban areas obtain more than half their calories outside the home (Citizen's ..., 1990). Fast foods, although convenient, tend to be high in fat and increase children's risk of becoming obese and of developing various chronic diseases in adulthood.

Children receive messages about food and nutrition from television and food packaging. The Center for Science in the Public Interest, a nonprofit nutrition advocacy organization, determined that nine of ten food commercials on Saturday morning television advertised foods high in sugar, salt, or fat. Children also learn about nutrition from what they observe around them at school and at home. One study found that preschoolers were better able to describe the food their parents ate than parents were able to describe what their preschoolers ate (Hellmich, 1992).

Nutrition Education

One of the U.S. DHHS's health promotion objectives is to increase the number of schools that provide nutrition education from preschool through twelfth grade. Nutrition education in school is most effective when delivered in the context of a comprehensive health education program and when school meal programs serve as "laboratories" where students can practice what they learn in class. The "offer versus serve" practice, adopted by some high schools and elementary schools, permits students to select three of five foods presented at lunch. Giving children such choices allows them to apply their understanding of nutrition.

What Schools, Nutritionists, and Parents Can Do

In order to foster children's knowledge of nutrition, the National Health/Education Consortium recommends that schools and school personnel:

- offer nutrition education as part of a comprehensive health education program;
- coordinate nutrition education in the classroom and meals served in the cafeteria;
- provide materials for parents about nutrition and about talking to their children about nutrition; and
- offer only nutritious foods at school, and use the "offer versus serve" practice.

To help schools' efforts, dietitians and nutritionists can speak to students about good nutrition, stressing the impact of nutrition on physical and cognitive development. They can also discuss with school administrators ways of building nutrition education into school curricula. To reinforce the efforts of schools and nutritionists, parents can:

- set a good example by eating healthfully;
- let their children help to prepare meals and experiment with different foods;
- regularly expose their children to new foods; and
- encourage school officials to implement new child nutrition programs, or improve existing programs.

This digest was adapted from: Troccoli, Karen B. (1993). *Eat To Learn, Learn To Eat: The Link between Nutrition and Learning in Children.* Washington, DC: National Health/Education Consortium. ED 363 400.

For More Information

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